

~~87. A displacement unit for a manipulation system, which comprises~~

- ~~(a) components which are adjustable relative to each other,~~
~~(b) a guiding device for guiding the components, and~~
~~(c) a control unit having~~
- ~~(1) a pressure fluid control valve for actuating one of the components by the pressure fluid, and~~
 - ~~(2) a control module cooperating with the pressure fluid control valve and comprising a logic unit, the control module being connectable to a central control unit by an interface,~~
 - ~~(3) the pressure fluid control valve and the control module being integrated into one of the components.~~

88. Displacement unit according to claim 87, comprising at least one signaling and monitoring element connected to, and cooperating with, said control unit and disposed in one of said components.

89. Displacement unit according to claim 88, wherein said signaling and monitoring element is a limit switch, a proximity switch, a displacement measuring system, a position detection system, a vibration sensor, or force sensor.

~~90. Displacement unit according to claim 88, wherein at~~

least one signaling and monitoring element comprises said control module.

91. Displacement unit according to claim 87, wherein at least one of said components comprises at least one fixing device for said at least one signaling and monitoring element.

92. Displacement unit according to claim 87, wherein one of said components comprises an electric distribution bus bar.

93. Displacement unit according to claim 92, wherein signaling and monitoring elements and said pressure fluid control valve and said control module are arranged displaceably on said electrical distribution bus bars.

94. Displacement unit according to claim 92, wherein said distribution bus bar comprises control lines integral into one of said components.

95. Displacement unit according to claim 87, wherein one of said components comprises a pressure fluid distributor bar.

96. Displacement unit according to claim 95, wherein said distributor bar comprises pressure fluid lines integrated into one of said components.

97. Displacement unit according to claim 95, wherein said pressure fluid control valve is arranged in said distributor bar.

98. Displacement unit according to claim 87, wherein one of said components comprises at least one interface to cooperate by control lines and fluid lines with at least one control unit of an additional displacement unit.

b 99. Displacement unit according to claim 98, wherein connection openings for said pressure fluid and inputs and outputs for signals of said control unit are arranged at a mechanical interface, the connection openings being connectable by a coupling device with said at least one control unit of said additional displacement unit.

100. Displacement unit according to claim 87, wherein said interface comprises inputs and outputs for signals and comprises a plug-in coupling device, said control unit being connectable by said coupling device to a bus line configured as central connecting line leading to said central control unit.

101. Displacement unit according to claim 87, wherein said interface comprises connection openings for said pressure fluid and comprises a plug-in coupling device, said control

unit being connectable by said coupling device to a fluid line.

102. Displacement unit according to claim 87, wherein said interface comprises inputs and outputs for signals and comprises a plug-in coupling device, said control unit being connectable by said coupling device to a bus line configured as central connecting line, leading an external input and output device.

b 103. Displacement unit according to claim 87, wherein said control unit comprises a memory for storing individual motions of the components.

104. Displacement unit according to claim 87, wherein said control unit comprises a control power source.

105. Displacement unit according to claim 87, wherein said control unit comprises an interface for an external power source.

106. Displacement unit according to claim 87, wherein said logic unit consists of at least one logic element which processes logic and bus information in order to determine and monitor the positions of one of said components of said displacement unit.

107. Displacement unit according to claim 106, wherein said logic element is a microprocessor connected by control lines and conductor lines with said interface.

108. Displacement unit according to claim 107, wherein said microprocessor is connected by control lines and conductor lines with an evaluation unit and a driver and a D/A converter and a memory for storing individual motions of the components.

b 109. Displacement unit according to claim 106, wherein said logic element is an electronic module.

110. Displacement unit according to claim 106, wherein signaling and monitoring elements connected to, and cooperative with, said control unit comprise said logic element.

111. Displacement unit according to claim 87, wherein said pressure fluid control valve is a servo valve.

112. Displacement unit according to claim 87, comprising a pressure fluid drive for adjusting the components.

113. Displacement unit according to claim 112, wherein said drive comprises at least one transmission element connected with one of the said components.

114. Displacement unit according to claim 108, wherein said drive comprises a cylinder pipe and end face closing elements positioned so as to be adjustable relative to one another.

115. Displacement unit according to claim 108, wherein said pressure fluid control valve is comprised of valve cartridges arranged in a guide mechanism of said drive.

b 116. Displacement unit according to claim 87, wherein said pressure fluid control valve comprises said control module.

117. Displacement unit according to claim 87, wherein a first one of said components is arranged to move relatively to a frame-shaped second one of said components so as to be relatively displaceable by means of said guide device.

118. Displacement unit according to claim 117, wherein said first component is secured by a securing device arranged detachably on said second component in at least one direction of movement.

119. Displacement unit according to claim 118, wherein said securing device is a damping mechanism, a braking device

or an arresting device.

120. Displacement unit according to claim 87, wherein said control unit comprises an input device.

121. Displacement unit according to claim 120, wherein the input device comprises a touch screen combined with a display element.

122. Displacement unit according to claim 121, wherein said display element is a display light-emitting diode.

123. Displacement unit according to claim 87, comprising wireless means for transmitting data from said control unit to said central control unit.

124. Displacement unit according to claim 87, comprising a local positioning system for detecting the position of said components.

125. Displacement unit according to claim 87, comprising a data glove connected by inputs and outputs to said control unit or said central control unit.

126. A displacement unit for a manipulation system, which

~~comprises~~

- (a) components which are adjustable relative to each other,
- (b) a pressure fluid drive for adjusting the components, the drive having
- (1) an outer surface,
- (c) a guiding device for one of the components, and
- (d) a control unit, the control unit having
- (1) a pressure fluid control valve connected to the drive for actuating the drive by the pressure fluid,
- (2) a control module cooperating with the pressure fluid control valve and comprising a logic unit, the control module being connectable to a central control unit by an interface, and the pressure fluid control valve and the control module being mounted on the outer surface of the drive, and
- (3) a display element.

127. Displacement unit according to claim 126, wherein said interface of said control unit comprises inputs and outputs for signals and is a plug-in coupling device, said control unit is connectable by said coupling device to a bus line configured as central connecting line, to cooperate with said central control unit.

~~128. Displacement unit according to claim 126, wherein~~

~~said drive comprises at least one transmission element~~
connected with one of the said components.

129. Displacement unit according to claim 128, wherein said one component is arranged to move relatively to a frame-shaped other component so as to be relatively displaceable by means of said guide device.

130. Displacement unit according to claim 126, wherein said interface of said control unit comprises said inputs and outputs for signals and is built by said plug-in coupling device, said control unit is connectable by said coupling device to a bus line configured as central connecting line, to cooperate with an external input and output device.

131. Displacement unit according to claim 126, wherein said control unit comprises a memory for storing individual motions of said drive.

132. Displacement unit according to claim 126, wherein said control unit comprises a control power source.

133. Displacement unit according to claim 126, wherein said control unit comprises an interface for an external power source.

~~134. Displacement unit according to claim 126, wherein~~
said logic unit consists of at least one logic element which
processes logic and bus information in order to determine and
monitor the displacement parameters of said drive.

135. Displacement unit according to claim 129, wherein
said logic element is a microprocessor connected by control
lines and conductor lines with said interface.

b 136. Displacement unit according to claim 135, wherein
said microprocessor is connected by control lines and conductor
lines with an evaluation unit and a driver and a D/A converter
and a memory for storing individual motions of the components.

137. Displacement unit according to claim 134, wherein
said logic element is an electronic module.

138. Displacement unit according to claim 126, wherein
said drive comprises an electric distribution bus bar.

139. Displacement unit according to claim 130, wherein
control lines are integrated in said distribution bus bar.

140. Displacement unit according to claim 126, wherein
~~said drive comprises a pressure fluid distribution bar.~~

~~141. Displacement unit according to claim 140, wherein~~
lines for said pressure fluid are integrated in said
distribution bar.

B' 142. Displacement unit according to claim 140, wherein
said pressure fluid control valve is arranged on or in the
pressure fluid distribution bar and is connectable by openings
with openings for said pressure fluid provided in said
distribution bar.

143. Displacement unit according to claim 126, wherein
said control unit is directly connected at said drive, said
drive comprising a cylinder pipe and end face closing elements
~~positioned so as to be adjustable relative to one another.~~